

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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NUCLEAR REGULATORY COMMISSION

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BRIEFING ON STATUS OF NUCLEAR SAFETY
IN EASTERN EUROPE AND THE FORMER
SOVIET UNION

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PUBLIC MEETING

Nuclear Regulatory Commission
One White Flint North
Rockville, Maryland

Monday, March 8, 1993

The Commission met in open session,
pursuant to notice, at 2:30 p.m., Ivan Selin,
Chairman, presiding.

COMMISSIONERS PRESENT:

IVAN SELIN, Chairman of the Commission
KENNETH C. ROGERS, Commissioner
JAMES R. CURTISS, Commissioner
E. GAIL de PLANQUE, Commissioner

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STAFF AND PRESENTERS SEATED AT THE COMMISSION TABLE:

WILLIAM C. PARLER, General Counsel

JOHN HOYLE, Assistant Secretary

JAMES TAYLOR, Executive Director for Operations

HAROLD DENTON, Director, Office of International Programs

JAKE WECHSELBERGER, Office of the EDO

MICHAEL CONGDON, Senior Foreign Policy Advisor

JAMES SHEA, Assistant Director, Office of International Programs

DR. NIKOLAI SHTEYNBERG, Chairman, Ukrainian State Committee for Nuclear and Radiation Safety

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P-R-O-C-E-E-D-I-N-G-S

2:30 p.m.

CHAIRMAN SELIN: Good afternoon, ladies and gentlemen.

The staff is here today to provide the Commission with an update on the status of nuclear safety issues in Eastern Europe and the former Soviet Union, and in particular on the activities of the NRC and to some degree the rest of the U.S. government in this area.

The last briefing on the subject that we had was on December 22nd of last year, a briefing that covered a range of U.S. nuclear initiatives with Russia and Ukraine, including the International Science and Technology Centers, the U.S. efforts of safe and secure dismantlement, the purchase by the U.S. of highly enriched uranium from Russia, and efforts to improve control in accounting and physical protection of nuclear materials.

Since our last meeting, several events have occurred. We've seen a number of press reports announcing plans by the Russian government to build more nuclear power reactors, including some 30 new reactors over the next two decades. The staff also recently held a meeting with consultants to obtain

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1 advice on effective approaches that the NRC might
2 consider for improving nuclear safety in the former
3 Soviet Union. This meeting appeared to be useful and
4 informative and perhaps the staff will comment on
5 this. The staff has recently assigned a person to
6 assist the G-24 efforts in Brussels. We hope to hear
7 more about how the assignment is working.

8 We also have here today, by happenstance,
9 the Chief Nuclear Regulator of Ukraine, Doctor
10 Shteynberg, who will give us a few minutes of an
11 update from his point of view.

12 Okay. Mr. Denton, would you please begin,
13 or Mr. Taylor? Excuse me.

14 MR. TAYLOR: (Slide) May I have the first
15 slide, please?

16 Mr. Chairman, we will quickly today go
17 through some of the important areas of cooperation
18 which we have with Russia and Ukraine. The first
19 slide is only to emphasize the differences that have
20 ensued due to the breakup of the former Soviet Union.
21 There continue to be events that are of concern in
22 plants that I think the Commission is familiar with
23 and this has been reported in the press. We do note
24 that the breakup has, we believe, put more distance
25 between the design and technical organizations to many

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1 of the plants that are currently operating in both
2 Russia and the Ukraine.

3 (Slide) Next slide, please.

4 Importantly in reporting to the
5 Commission, as the Commission knows, we signed an
6 agreement back in 1988 to provide safety cooperation
7 with the then Soviet Union in the emergence of the
8 republics with the agreement of the Department of
9 State. We're revising the basic structure and this
10 has been agreed to by both Russia and the Ukraine. We
11 will now have a committee which will have the joint
12 participation of both Russia and Ukraine at the same
13 annual meetings. The next meeting is scheduled for
14 Kiev, to begin the 29th or 30th -- I guess 29th of
15 March.

16 Is that right, Jake?

17 In Kiev. We have also rearranged this
18 committee structure such that I and a DOE Deputy
19 Assistant Secretary, now Frank Cole, will serve as co-
20 chairmen from the U.S. side, and we have opposite
21 numbers from both the regulatory and operating
22 organizations in both Russia and Ukraine.

23 So, in addition to the normal technical
24 cooperation that has gone on, and I'll touch on that
25 very briefly, what's continuing, we have had with

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1 money provided just at the end of 1992 we have
2 initiated at both the Department and within the NRC
3 extensive cooperation funded under the so-called
4 Lisbon Initiatives. This is using Agency for
5 International Development funds and this whole
6 operation is operating under the JCC with a
7 coordinating committee with membership from the
8 Department of State, Department of Energy, AID and
9 NRC. The U.S. committee had an important meeting just
10 a week ago and I was heartened by the progress and
11 discussion of where we are after only four or five
12 months of initiating the work that we -- both from the
13 Department and our side.

14 We will, when we go to Kiev, confirm the
15 revised structure and will initial or sign the
16 appropriate documents extending the agreements since
17 it is due to expire I think about the 26th of April of
18 this year. This is with the full backing of the
19 Department of State.

20 (Slide) Slide 4, please.

21 In addition to the extensive work going on
22 under the Lisbon initiatives, we are continuing and
23 have proposed to have at least a basic agreement to
24 continue five working groups that are listed on the
25 slide and will continue these specific working groups

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1 both on the part of the Department for the work of 7
2 and 11, and the other three working groups which are
3 largely NRC run operations. So, we are continuing
4 some of the technical working groups which existed
5 before the new initiatives.

6 (Slide) The next slide is slide 5. I
7 mention, first of all, the Department of Energy work.
8 DOE is working to establish regional training centers
9 in Ukraine, at Khmel'nitskiy and in Russia, at
10 Balakovo. DOE is making arrangements to provide
11 Khmel'nitskiy with a simulator. The Balakovo
12 simulator was previously purchased and I believe is
13 now in Russia.

14 Is that right, Jake?

15 MR. WECHSELBERGER: Yes. It's at
16 Balakovo.

17 MR. TAYLOR: At Balakovo? And this is to
18 support both those training centers in both countries.

19 In addition, DOE continues the development
20 of emergency operating instructions, largely starting
21 out of work at Novovoronezh and the implementation of
22 these emergency operating instructions at plants is
23 scheduled to begin in November of this year. They are
24 also planning emergency operating instruction work for
25 the thousand megawatt VVERs and for the VVER-440/213s,

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1 and are pairing with various plants of this type in
2 both Russia and the Ukraine.

3 DOE has also just begun certain risk
4 reduction efforts. They've contracted and have
5 started, really starting back in September, focusing
6 on fire protection improvements. They've done
7 walkdowns using contractors under DOE direction at
8 Smolensk and Zaporozh'ye. This is largely to try to
9 assess where detection and suppression systems might
10 contribute to reducing the safety risk from fire.

11 I'll now move quickly into NRC's work and
12 where we stand with NRC.

13 (Slide) May I have the next slide,
14 please?

15 This is a quick overview trying to outline
16 the agreed to priorities. These priorities were
17 agreed to in meetings with GAN and with Doctor
18 Shteynberg's organization last July here and Doctor
19 Shteynberg is here to talk further about some of these
20 initiatives with us this week. But first, this is a
21 list of priorities from GAN which were agreed to and
22 were further agreed to, I gather -- was it December?

23 MR. WECHSELBERGER: December.

24 MR. TAYLOR: Mr. Gutzalov and his people
25 were here. I won't spend a lot of time describing

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1 these, but these initiatives are already underway. We
2 have had people here from GAN and also from their
3 opposite number in Ukraine and have really kicked off
4 these activities.

5 (Slide) The next slide is a breakdown --
6 those are the major priorities this year under the
7 Russian initiative. We are looking at additional
8 funding for some projects in 1993. At the meeting
9 last week we received assurances from AID and from the
10 Department that additional AID money would be
11 available from the '93 funds and we therefore expect
12 an expansion of projects with Russia. In fact, we do
13 expect to initiate the planning for a PRA or PSA on a
14 thousand megawatt VVER. Doctor Shteynberg and I were
15 just talking about that a few minutes ago. If we
16 develop something like that, we would make that
17 available to both Russia and Ukraine.

18 (Slide) Slide 7 is an overview of the
19 projects that we've initiated in cooperation with
20 Doctor Shteynberg for assisting in the support of the
21 regulatory organization in Ukraine. Again, these
22 projects were agreed to after extensive discussions
23 with Doctor Shteynberg and his people. Many of the
24 projects are underway. Some of Ukraine regulatory
25 people have been here working with NRR in the

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1 licensing area and I think totally this year we expect
2 between Russia and the Ukraine about 130 people to be
3 here at various times for training, both at our
4 training center and training within the staff. That's
5 quite a number of people in a year's time.

6 (Slide) The next slide is a continuation
7 of the priority of projects with Ukraine. I would
8 note that both in enforcement and in the assistance on
9 the creation of a legal framework, the Office of
10 General Counsel has been supportive in both those
11 areas and I believe are continuing to assist Ukraine
12 in the attempt to draft the basic laws to support
13 regulation of the nuclear power plants in Ukraine.

14 (Slide) The next slide, slide 9, are some
15 additional projects that are going on. The first one
16 that I'll mention is, as I believe the Commission is
17 aware, under Bob Burnett in the Office of NMSS, we are
18 continuing to support in Russia the concept of the
19 development of an MC&A, material control and
20 accounting system. But that effort is being supported
21 separate from AID under the SSD. That program is
22 continuing.

23 With regard to other AID monies, the final
24 bullet on that is an AID-funded activity which we only
25 partially funded with 1992 funds. We'll pick that up

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1 again with Russia in the 1993, as soon as those funds
2 are released to us.

3 (Slide) Again at Ukraine, we are also
4 utilizing our resources of NMSS to potentially provide
5 to Ukraine the means and the training to set up both
6 a physical protection and nonproliferation type
7 requirements, control of materials. Again, that is
8 MC&A work. That is again supported by the SSD outside
9 of the Lisbon Initiatives. The last point is another
10 point in Ukraine which we have partially funded in
11 1992.

12 (Slide) Slide 11 outlines requests from
13 the Ukraine which will be part of our discussions this
14 week with Doctor Shteynberg. But it is an outline of
15 the particular areas that assistance has been
16 requested which we would hope at least to fund a
17 number of these out of 1993 AID money.

18 (Slide) Slide 12 is additional direct
19 assistance which we are plan to fund or will fund
20 partially in 1993. This is providing analytical
21 simulators for both Ukraine and Russia regulators.
22 This includes the hardware and equipment to do a plant
23 analysis. Doctor Speis is heading that effort here
24 from the NRC and this is to support the technical
25 capabilities within the regulatory organizations.

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1 These other projects are also potentially planned
2 during this period both in 1992 and 1993.

3 (Slide) Again on slide 13, in 1993 we do
4 plan an IPE or PRA at a VVER-1000. If the Swedish
5 succeed in developing a PRA or IPE for Ignalina, and
6 that project you've read about in the press has had
7 certain stops and starts. We would hope to provide
8 peer review. I would think we use both Russia and
9 Ukraine, not just Russia but peer review of the
10 Swedish PRA. We would definitely want the regulatory
11 organizations to be involved in a review of this
12 document if it's ever completed.

13 (Slide) May I have slide 14?

14 This is strictly a summary of what we've
15 been doing under AID support. We had the meeting in
16 July, as I mentioned. We signed the agreement with
17 AID in September. We had a detailed meeting with GAN
18 in December and, as you know, Doctor Shteynberg is
19 here today and this week to further flesh out the
20 activities that we've planned. We'll have -- the next
21 to the last bullet discusses the number of people that
22 we expect to actually participate and work here in the
23 U.S. during this calendar year.

24 We are proceeding to do the necessary
25 procurement of deliverables to provide support such as

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1 the analytical support and computer support such as we
2 can for both regulatory organizations.

3 (Slide) Slide 15, please.

4 I did meet just this last week with the
5 Department of Energy working group people who have
6 been operating in Work group 7. As the Commission may
7 recall, that group was put together to look at the
8 health and environmental effects from Chernobyl.
9 There were a lot of projects in that group. I must
10 say the Department people had a review and I believe
11 are now concentrating and will continue to fund Work
12 Group 7, principally concentrating on the remainder of
13 the environmental work, but most importantly to set up
14 a leukemia and thyroid protocol in cooperation with
15 Ukraine and Byelorussia as part of the work of Work Group
16 7.

17 As the Commission knows, there's been the
18 discussion of a comparable group potentially looking
19 at other sites in the former Soviet Union such as the
20 Chelyabinsk area in terms of study of health effects.
21 If that group is ever started, and that would take a
22 lot of departments interested in that. Commissioner
23 de Planque has shown a special interest. We would
24 expect Work Group 7 to eventually be absorbed in that
25 effort. We'll make the necessary adjustments.

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1 Hopefully if more agencies participate, this would be
2 a more broadly funded area and potentially allow us to
3 -- as you know, some of our people have already been
4 to Chelyabinsk to begin to collect health information
5 as a result of some of the effects of the various
6 releases that have occurred in that area of Russia
7 through the last four or five decades.

8 CHAIRMAN SELIN: Excuse me, Mr. Taylor.
9 I'm not clear as to what the status is of the Russian
10 Federation, American cooperation on that work. Is
11 there research being done? Is it still in
12 the preparatory phase?

13 MR. TAYLOR: It's still in the -- we have
14 funded the certain amount of money from both the
15 Department and from us for data preservation. That's
16 about all that's happened so far. Those projects have
17 been funded working with the Department. The people
18 who are working on it, Doctor Yaniv from NRC staff and
19 the group in the Department of Energy are drawing up
20 some of the draft documents for this larger effort.
21 The issue that I see is getting not only people to
22 agree from the U.S. side to cooperate, but also to
23 contribute to funding it. It will be a big funding
24 question. So, that's about where things stand on that
25 group.

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1 COMMISSIONER de PLANQUE: Jim, just from
2 a logical point of view, is it easier -- if that work
3 were to expand, is it easier to put it under the
4 Working Group 7 framework or to go for a separate MOC?

5 MR. TAYLOR: Well, I think a bit
6 bureaucratically it will be difficult to sweep all
7 these organizations into Work Group 7. I think
8 they'll want a separate type of agreement. That's my
9 view.

10 COMMISSIONER de PLANQUE: So, it hangs on
11 whether or not you can get further agency interest in
12 it.

13 MR. TAYLOR: That's right.

14 COMMISSIONER de PLANQUE: And whether
15 there's funding forthcoming. If it were to stay that
16 just NRC and DOE were the major players, is then it
17 easier to keep under Working Group 7?

18 MR. TAYLOR: Yes. Then it's a little
19 easier to operate, I think, if it's the original two
20 agencies. If it expands, I think other agencies will
21 want a much stronger voice, particularly if they're
22 contributing to it. But that's a detail, I think,
23 that I'd be most heartened first to see people say
24 they want to participate financially from the U.S.
25 side before making that decision. For now, we'll just

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1 continue with what we're doing.

2 COMMISSIONER de PLANQUE: Right. On the
3 data preservation, is there any real progress made
4 there? Are there target dates for accomplishing any
5 of that work?

6 MR. TAYLOR: I don't have that. I might
7 get back to you with that, if I can.

8 COMMISSIONER de PLANQUE: Sure.

9 MR. TAYLOR: I'll check with Shlomo Yaniv
10 and tell you exactly where things stand.

11 COMMISSIONER de PLANQUE: Okay.

12 MR. TAYLOR: (Slide) Slide 16.

13 I believe that through the years we've
14 been able to develop mutual respect for colleagues in
15 both Russia and Ukraine. I believe that under this
16 cooperation that was started in 1988, we've moved
17 naturally into implementing the Lisbon Initiatives.
18 It has not been difficult to meet and talk about what
19 the issues are. We have succeeded in achieving a
20 number of things, not the least of which is some very
21 important research which we placed about two years ago
22 through Kurchatov inside Russia and the Russian
23 Republic. We have had -- are getting results. I
24 understand the hydrogen reports have just come in.
25 The staff is reviewing those on hydrogen combustion

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1 work. This is under U.S. funded research inside the
2 Russian Republic.

3 We believe both Russia and Ukraine
4 regulators are giving us good feedback and suggestions
5 on how to make the Lisbon Initiative more beneficial
6 for both of them and I expect that will continue.

7 With regard to recommendations for future
8 U.S. cooperation, I've mentioned a number of these .
9 There may be some things that we can introduce, such
10 as better interior communications in some of the
11 plants, which although very inexpensive may enhance
12 safety. Those are things that we've observed and
13 we'll be talking about some of these things when we go
14 to Kiev and meet with representatives from both Russia
15 and Ukraine.

16 I did mention the IPE and I think that we
17 all agree that both Russia and Ukrainian involvement
18 in the effort is very important as we complete a PRA
19 and try to make decisions of what might be safety
20 significant.

21 I would note that we did get a commitment
22 from Minister Mikhailov that he would provide a
23 priority of projects from the Russian side. They
24 would take a look and he committed that to both the
25 Department of Energy, Department of State and to us in

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1 a recent meeting at the Department of State. I want
2 to be sure that we're working on the priorities
3 certainly from the operating side as seen by the
4 Ministry and he promised to provide such. We'll talk
5 further about that when we go to Kiev in about three
6 weeks.

7 That concludes my portion of the
8 presentation. Harold Denton will continue.

9 CHAIRMAN SELIN: Before you go on, would
10 you just say a word about what demands these are
11 making on the staff, how that compared with last year
12 and what the prospects are with your new staff
13 planning?

14 MR. TAYLOR: I believe that we can
15 continue in the current budget climate with what we
16 have planned. The staff -- a lot of this bringing
17 Russian or Ukraine professionals over here. There are
18 trips occasionally for us, but the manpower demand
19 other than assimilating them into the staff for the
20 work we're doing now is, I think, within current
21 resources. I think depending upon how we look at 1995
22 resources, we'll assess this. But what I see going
23 into '94, I think we have adequate staff.

24 Jake, do you want to add anything to that?

25 Jake is the project manager for me on this

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1 subject.

2 MR. WECHSELBERGER: Yes. I think your
3 synopsis is essentially correct, Jim. The majority of
4 our work is in bringing the Russian and Ukrainian
5 regulators into the United States to work with our
6 people here in the respective offices. While they are
7 over here though, it does take their respective
8 offices' support to facilitate their training. So, it
9 is a resource commitment that the offices have to make
10 in that respect.

11 CHAIRMAN SELIN: But that commitment is
12 something that you've figured into your program for
13 1994?

14 MR. TAYLOR: Yes.

15 MR. DENTON: I'll cover the highlights and
16 other areas and only those things which have occurred
17 since the briefing last year about this time. So,
18 things that were covered then, like OSARTS and assets
19 and so forth, I won't rehit.

20 The big hitter who entered the arena was
21 the G-7 in July with its recommendations and led to a
22 number of actions. I've listed here the items in
23 their action plan. One of the important things they
24 said was no work should be done whose objective it was
25 to extend RBMK operation beyond two years. I'll come

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1 back to this a little bit later in the briefing.

2 There was also a multilateral fund
3 established. The European donors have put in tens of
4 millions of dollars now and I think the bank is on the
5 verge of being established. The G-7 summit meets
6 again in Tokyo in July and will be another opportunity
7 to revisit what the G-7 countries think.

8 (Slide) The next slide, please. The next
9 one also.

10 One of the things G-7 did was establish G-
11 24 as the coordinating committee for monitoring
12 projects and assure that needs were being met and
13 consistency. They put together an organization to
14 oversee this activity. The plenary working group is
15 headed by Ms. Vervill from the State Department. For
16 the steering committee, the State Department and
17 Energy Department co-chair for the U.S. side U.S.
18 participation there and the NRC is represented in
19 those. But since DOE has the most money, we thought
20 they should be in the chair.

21 Doctor Bennett from the EC heads up the
22 steering committee in the Secretariat and that's where
23 Mr. Ramsey has been assigned since February. All
24 reports are that things are going well, but it's a
25 little too early to assess I think the long-term

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1 response we'd want to make since he just went there in
2 February.

3 I did want to go a bit into some of the
4 information that we've gotten from G-24 and what we've
5 learned from the database. The next slide sort of
6 summarizes what the situation is and I'll go into more
7 detail on each of these in just a moment. But the
8 total contribution is rather large. I was surprised
9 to find that it's \$350 to \$400 million reported by all
10 the countries as going into nuclear safety in the
11 former Soviet Union and Eastern Europe. The principal
12 donors are listed here.

13 Let me say a word about the recipients.
14 Under regional projects, that's where the donor has
15 not specified exactly who the recipient is. So, it
16 could be former Soviet Union countries or it could be
17 Eastern Europe, for example. Of course, as you would
18 expect, most of the money is going into operational
19 safety.

20 (Slide) The next slide sort of breaks out
21 where the money is going by the technology sector.
22 Over 60 percent of the money is going into what has
23 been termed operational safety. That's the software
24 area. I'd say training procedures, simulators and
25 related aspects. Most of the money in radiation

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1 protection is going into Chernobyl and Chelyabinsk
2 type studies. You'll notice there's not a lot of
3 money yet into either near-term implementation or
4 long-term implementation. Money is going into the
5 near-term assessments and out of that should flow
6 eventually implementation.

7 CHAIRMAN SELIN: Before you get off that,
8 Mr. Denton, in your opinion how much money does it
9 make sense to invest in studies and analyses and
10 assessments? At what point should the Russians or the
11 Ukrainians be able to take these studies and start
12 implementing them themselves? Do they need EC people
13 or U.S. people to be with them as they implement these
14 efforts or are they in an implementable form when this
15 money has been spent?

16 MR. DENTON: I think we've reached a
17 plateau of sorts on studies and a lot has been
18 learned. It's time to implement the results of the
19 studies that we've done. That doesn't mean the
20 studies are complete. I think we can implement what
21 we know now needs to be done and then later on do more
22 studies and more implementation.

23 CHAIRMAN SELIN: Who is we?

24 MR. DENTON: We being the world in
25 general. If you take all the studies that have been

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1 done by everybody, including the agencies I've listed
2 here, there's a lot now known. You can still argue
3 that -- and as Doctor Shteynberg and I discussed this
4 morning, it doesn't mean that each plant has had a
5 detailed safety analysis. But the types of plants
6 that are operating there have been looked at in detail
7 from a general perspective.

8 CHAIRMAN SELIN: At what point are the
9 studies enough and the communications enough and the
10 training enough that we can just say to the Russians
11 and the Ukrainians, "Why don't you start implementing
12 these things? Why don't we start thinking about some
13 of the more long-range activities?" How much further
14 Western assistance of operational safety or short-term
15 implementation, non-material implementation, I'm just
16 talking about training, procedures, fire safety as
17 opposed to instrumentation, control or simulators?
18 How much -- when is the point where a critical mass
19 has been reached and that portion can be turned over
20 to the Eastern operators for awhile?

21 MR. DENTON: I think they've reached that
22 point on the VVER-440s. There's been a lot of studies
23 by DOE that have been published and by IAEA and other
24 people and with the knowledge the Finns have and
25 Hungarians about that plant. I just don't see much

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1 more need in that area. The VVER-1000 has some unique
2 aspects, like xenon oscillations, that may require
3 some specialized studies and the RBMK I tend to shy
4 away from since we haven't really taken that on. But
5 I think definitely the 440s have been essentially
6 completely studied.

7 CHAIRMAN SELIN: Even the 1000s, how much
8 of that is study and how much of that is getting
9 instrumentation to know how to avoid the unstable
10 regions of operation?

11 MR. DENTON: I think -- you'd probably get
12 differing opinions on this, but I think they're
13 getting close enough to Western type plants and are
14 well understood that it's just more a question of
15 implementing what's needed than doing detailed studies
16 there. You might need studies on how to hook up
17 instrumentation and that sort of thing, but basically
18 what's needed for feedwater controls or pressurizer
19 level controls is all known throughout the West.

20 CHAIRMAN SELIN: Okay. Thank you.

21 MR. DENTON: (Slide) The next chart shows
22 the level of commitments of the various recipients.
23 You'll notice the regional unspecified is the largest
24 category. That's where the donor has not specified
25 which of the particular countries may be getting

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1 assistance.

2 CHAIRMAN SELIN: Are those like
3 unidentified budget cuts? Is that really a nice way
4 to say that donors haven't really committed themselves
5 irreversibly to those commitments, that there's still
6 some negotiations to be done before those become real
7 commitments?

8 MR. DENTON: Mike Congdon has looked into
9 this area. Let me ask him to enlighten us on that.

10 MR. CONGDON: I think a good example of
11 the regional unspecified is a fairly large training
12 project by the Japanese. It's close to 40 percent of
13 that and much of that, we understand, is going to the
14 Russian and the Ukrainian operators and the Japanese
15 have begun to implement it. So, I don't think that
16 it's in the early planning stages. It's just
17 something that is across the board both in the CIS and
18 in Eastern Europe.

19 CHAIRMAN SELIN: They're real projects but
20 not known to us in detail?

21 MR. CONGDON: No, they're real projects
22 but they're with more than one country.

23 CHAIRMAN SELIN: Oh, I see. Okay.

24 MR. DENTON: Then there is the CIS
25 regional where they have specified to that extent.

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1 Clearly, Russia will be getting the majority of the
2 aid. Bulgaria will probably come in next. You can
3 wonder about the percentage the Ukraine is receiving
4 in looking at this table. They'll be getting some of
5 the CIS regional monies when it's finally decided.
6 But this is strictly just taking the database that's
7 been reported and cutting it and crosscutting it.

8 (Slide) The next chart shows how much of
9 the money in the database has actually been completed
10 or projects underway. What you find here is that
11 roughly half the money that we're talking about is
12 wrapped up in projects underway or completed. Very
13 few of them have been completed and about 50 percent
14 of the commitment has not started yet. It ranges from
15 just an expression of interest all the way to a
16 financial decision.

17 CHAIRMAN SELIN: Mr. Denton, if you just
18 put the operational money in that, is that mostly
19 spent? Is that mostly in the two right-hand columns?

20 MR. DENTON: Let me turn to Mike again for
21 that question.

22 MR. CONGDON: I don't have the figures
23 right in front of me, sir, but I think you could say
24 that most of what is underway is in training
25 assessment and most of training and assessment is in

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1 the operational safety area, yes.

2 CHAIRMAN SELIN: So the material projects
3 are much further behind?

4 MR. CONGDON: Yes. There may be less than
5 five percent.

6 CHAIRMAN SELIN: And that's not illogical,
7 but I just wanted to check that.

8 MR. DENTON: Let me turn quickly to
9 developments in some other agencies. The IAEA, we've
10 talked about on other occasions the status of the
11 Nuclear Safety Convention. That's awaiting some
12 breakthrough since there are now disagreements over
13 the scope and level of detail. The next meeting there
14 will come shortly.

15 The IAEA is also undertaking two new
16 studies. They have completed a safety analysis on the
17 VVER-440/230 and prioritized the improvements that
18 need to be made. They are proposing to do the same
19 thing for the 213s and for the VVER-1000s and for the
20 RBMKs and for each of those activities they are
21 requesting that their membership provide \$1.5 million
22 each. That proposal is under consideration.

23 The NRC has not participated to a great
24 extent in these studies, but many of the Central and
25 Eastern European countries have and it's been a

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1 valuable prioritization.

2 INSAG took a relook at the Chernobyl
3 accident since last year and if you haven't focused on
4 that, you might like to read what they now say about
5 the cause of the accident because it emphasizes
6 hardware deficiencies much more than did the original
7 INSAG report. They and the EC seem to be improving
8 their cooperation with each other.

9 Next I wanted to mention the NEA. The NEA
10 is taking the view that they don't intend to seek a
11 coordinating role even in regulatory matters,
12 preferring to leave that to G-24. But they have
13 undertaken several activities regarding research
14 capabilities and they've actively identified a couple
15 projects where they're looking at what research
16 capabilities exist in the former Soviet Union and what
17 will now be required to modernize and bring those
18 facilities up to date. This includes things like
19 thermal hydraulic test facilities in the countries.

20 (Slide) I also wanted to mention our
21 assistance to Eastern Europe which is being funded by
22 AID. If I could have the slide titled, "Eastern
23 Europe."

24 Roughly 40 percent of the money we
25 received from AID there is going into either the Czech

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1 or Slovak Republics, 20 percent to Hungary. Maybe 20
2 percent is targeted for Bulgaria and the remaining ten
3 percent for Lithuania. But we've spent very little
4 with Lithuania. It's going into these four areas for
5 those countries and DOE is also providing assistance
6 to those countries using AID funds.

7 The next slide hits some of the highlights
8 from the meeting that we had of consultants. These
9 were people who were participants at an A&S meeting in
10 Chicago this summer. They tended to be chairs of
11 individual workshops and were selected because they
12 had personally participated in previous programs
13 involving the Soviet Union. One of their
14 recommendations runs counter to where the G-7 is
15 today. They were taking the view that since RBMKs and
16 the VVER-230s will be operated for awhile, that G-7
17 should relax and permit more safety improvements in
18 those areas.

19 They also were strongly in support of a
20 lead plant concept with the idea that what the U.S.
21 does should not go over and spend two weeks and leave
22 and expect a fundamental management change to occur in
23 the safety culture of a plant, but with the idea that
24 it would be far more effective to have sort of a
25 permanent resident field office sort of arrangement at

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1 some plant so that the impact of the changes that we
2 are able to finance would be felt more strongly.

3 They also support the present programs
4 that Jim described that we're doing with the other
5 regulators. One point they made is that we shouldn't
6 lump all these plants together. The VVERs in Hungary
7 are quite different than the VVERs in Russia and
8 different countries have made different strides in
9 terms of modernizing and upgrading their plants and we
10 shouldn't treat them all in one class.

11 Another point was that helping these
12 countries help themselves often they have very
13 valuable views about what's really needed there and we
14 need to continue to find ways to rely on them to
15 identify the highest priorities. At one point the
16 push was that we should find a way to push maintenance
17 as an area of cooperation because they were concerned
18 that some plants, especially in Russia, might be going
19 downhill due to a lack of maintenance today.

20 Finally, I didn't want to miss this point,
21 that the operators whose plants are performing well
22 and who have achieved a considerable level of safety
23 should be brought in to assist those who haven't.

24 (Slide) Let me turn then to the last
25 three slides. The first slide sort of summarizes some

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1 obvious points you can draw from this briefing, I
2 think. It's interesting to look back and just five
3 years ago, in 1988, we were the only country providing
4 bilateral safety assistance to the Soviet Union. Look
5 at how many countries and organizations are involved
6 today. It's just been remarkable the growth of new
7 players. Several countries have targeted facilities
8 in countries like the Swedes at Ignalina for special
9 assistance. I mentioned that a lot of work has been
10 done, but primarily in studies and assessments and
11 very little in real implementation. I think it's now
12 time to build on these and move to practical
13 improvements in the plant.

14 (Slide) The next slide sort of is the bad
15 news. I think the improvements are going to come
16 slower than we had hoped. Practically all the
17 countries complain that the assistance is not getting
18 through to the plant and the operator level. The
19 funding is being spent in a donor country. That's
20 certainly true to some extent because there tend to be
21 studies. The economic conditions in some of these
22 countries and the decisions made by governments do not
23 really favor improved nuclear safety. Construction is
24 resuming on some plants, such as RBMKs, and which seem
25 to be going backwards. Regulatory authorities still

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1 need to be strengthened.

2 The Ukraine is developing an
3 infrastructure for dealing with safety. Doctor
4 Shteynberg started providing SALP reviews, for
5 example, in the Ukraine, but that country is still
6 facing energy needs that may lead to pressure, as the
7 future of Chernobyl for example.

8 (Slide) On the final slide, I think we
9 have to continue to respond and provide the regulators
10 what they are asking for and that's what the program
11 that's been described is doing. We also need to find
12 ways to move the U.S. and the international assistance
13 to the plant level and find ways to get more funding
14 through multilateral public or private finance into
15 these countries so they can make the actual changes in
16 the plant. It's one thing to talk about safety
17 assessments. I think it is time, as you brought up
18 earlier, Mr. Chairman, to make sure that the world
19 actually puts some of these improvements into place.

20 This concludes our presentation and we
21 would propose to invite Doctor Shteynberg to join us
22 at this time.

23 CHAIRMAN SELIN: I just wanted to ask you
24 one question before we get there. Is it foreseen that
25 there would be a kind of a partnership where the West

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1 would provide the materiel and its own experts, but
2 that the Eastern countries would pay for their own
3 people who would then take operational procedures and
4 modify them for new plants or take maintenance
5 procedures and modify them for new plants? Or do you
6 still have a situation where Russians are asking us to
7 pay Russians to do what they should be doing anyway?

8 MR. DENTON: I think it varies. Jim may
9 have a better feel than I do, having been a little
10 closer to it.

11 MR. TAYLOR: I believe that in the
12 emergency operating instructions the Department is
13 looking for Russian participation at their cost after
14 the models have been developed.

15 Do you agree, Jake?

16 That's as I understand it, as an example.

17 MR. DENTON: I don't think I know the
18 answer to that question. So little has reached the
19 implementation stage, it's kind of hard to tell. It
20 does seem to me that just in conversations on the
21 margins that the Russians in particular are getting
22 less and less interested in our assistance because it
23 doesn't seem to be getting to the plant. I think the
24 other countries as you move away from Russia are much
25 more willing and have some sort of cooperative

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1 approach and recognize the need for upgrades. But I
2 think many of the people I bump into from Russia are
3 beginning to doubt whether they'll get any real
4 assistance at the plant level from the U.S. or other
5 countries.

6 CHAIRMAN SELIN: You will all still be
7 here to answer questions after Doctor Shteynberg
8 talks?

9 MR. DENTON: Yes. We've given him a heads
10 up and --

11 DOCTOR SHTEYNBERG: Let me first of all
12 say that the participation here for me was a great
13 surprise. I understand this is one of the steps in
14 acquiring experience, my own personal experience. I
15 would like to thank Mr. Selin for offering me this
16 opportunity. I will be unlikely that I'll be able to
17 touch upon all the issues that have been looked at
18 today.

19 First of all, I'd like to touch upon the
20 bilateral, the cooperative efforts of the NRC and the
21 regulatory organization of Ukraine. Perhaps those
22 present here will remember that at the Munich meeting
23 there was a note being made into the protocol as to
24 the creation of new regulatory agencies. But I would
25 like to note here that the NRC management has realized

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1 this need even earlier that was still in 1987. I'd
2 like to note here that now we have a very close and
3 energetic type of relationship with the NRC, both with
4 the former Soviet Union's committee and now our
5 regulatory organization in the Ukraine.

6 Personally I'd like to say that I've
7 gained a great deal of experience here based on the
8 experience at the NRC and in terms of the structure
9 and the regulatory organization in Ukraine is based
10 very much on it. Regarding this, it's my view that
11 this experience that has been shown by the NRC is the
12 closest that we've had in our own work and it's
13 simpler and easier for us to implement it.

14 As to the cooperation, I'd like to mention
15 here that still in 1989 we have had concrete
16 experience with our own inspectors and the formation
17 of our regulatory organization. What we have started
18 last summer under the umbrella of the Lisbon
19 Initiative is what we have actually commenced earlier.
20 However, of course, the circle of interests and the
21 circle of activities have been considerably enhanced.

22 Once again I would like to express our
23 gratitude to the U.S. government and to the Nuclear
24 Regulatory Commission for the organizational efforts
25 in helping us to organize our organization. I'm not

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1 going to hover upon the details of our cooperation
2 because much has been shown here on the slides. I'd
3 like to, however, touch upon certain problems that
4 seem to be important to me and have been looked at
5 today as well.

6 Ultimately we are all interested in the
7 enhancement of the nuclear safety factor and the
8 regulatory organization is one of the organizations
9 that can implement and realize this. Mr. Selin, you
10 have posed the question quite correctly that there is
11 a large break between the research effort and the
12 actual investment in organizing this endeavor.

13 I think the sole finished research that we
14 can consider is the reassessment of the safety factor
15 at our nuclear power plants. I think only on the
16 basis of this analysis, finished analysis of the
17 safety factor can be actually operated at our plants.
18 Precisely because of this lack of analysis of the
19 safety factor, the enhancement of safety for
20 operational safety of nuclear power plants is lacking.

21 Thus, when we have seen here on our slide
22 the diagram of the operational safety factors, it's
23 difficult to say what it is actually. And thus, in my
24 view, the only way to approach this is to finish the
25 analysis of the safety factor to determine its

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1 critical points and then do the investment and to
2 implement the entire program.

3 The second interesting question that you
4 have posed was when are these Russians and Ukrainians
5 going to actually work with us? I'd like to say that
6 we've started working with you and we've always worked
7 with you. I'd like to state this and reiterate it,
8 that the safety, the responsibility for safety
9 operations of our nuclear plants in Ukraine, we are
10 responsible for and not the U.S. side.

11 CHAIRMAN SELIN: I just want to make clear
12 I'm talking about the operational people, not the
13 regulators.

14 DOCTOR SHTEYNBERG: Well, I'd just like to
15 mention the fact that our organization has commenced
16 a number of independent projects with your aid and
17 that of your colleagues. I believe that we're going
18 to increase the rate of our work even though, as you
19 know, we have a number of difficulties.

20 One more specific proposal that has arisen
21 as a results of the work of the past year. You know
22 quite well that in the experience of the former Soviet
23 Union we have this tendency to bury lots of money into
24 the ground. Therefore, I have a concrete proposal.
25 Concrete safety measures should be approved by both

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1 sides of the regulatory organizations. On one behalf
2 it's by the side that -- the country that is offering
3 the help, specifically the NRC. On the other behalf,
4 it's for the regulatory organization of the country
5 that receives the aid, namely Russia, Ukraine,
6 whatever. Firstly, it will guarantee that the
7 investment will reach its destination. Secondly, this
8 will enhance the problem that has been recorded in the
9 Munich protocol, namely the role of the regulatory
10 organizations of the former Soviet Union.

11 CHAIRMAN SELIN: That's very clever.

12 DOCTOR SHTEYNBERG: Once again I would
13 like to thank you for having given me the opportunity
14 to participate in these hearings. Thank you so much,
15 and I'm ready to answer any questions.

16 CHAIRMAN SELIN: That's a very clever
17 idea, that there be that cooperation at the regulatory
18 level.

19 Doctor Shteynberg, could you give us a
20 general assessment of the safety of the Ukrainian
21 power plants today compared to, say, three years ago,
22 regardless of the source of the improvements?

23 DOCTOR SHTEYNBERG: I'll come back to what
24 I have stated. Unfortunately, we are unable to say
25 anything about the safety of our nuclear power plants.

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1 We could only make some intuitive conclusions. From
2 the very onset, our power plants never had the safety
3 analysis because any evaluation that I would make or
4 any of my colleagues as to the operational safety
5 would be a matter of our own personal assessment.

6 CHAIRMAN SELIN: Ken?

7 COMMISSIONER ROGERS: Yes. What is your
8 situation today with respect to your regulatory staff,
9 your regulatory experts? I know some months ago when
10 you visited us you were concerned about being able to
11 retain them. Have you had some success in being able
12 to keep good people in your regulatory organization?

13 DOCTOR SHTEYNBERG: Unfortunately we did
14 not attain large successes here. We have been losing
15 and we continue losing staff. It's a matter of
16 elementary arithmetic. When the level of salaries is
17 three and fourfold less than elsewhere, certainly
18 we're losing staff. That was a problem and still
19 remains a problem.

20 COMMISSIONER ROGERS: Also on the creation
21 of a legal framework, where does that stand with
22 respect to establishing the authority of the
23 regulators on a legal basis?

24 DOCTOR SHTEYNBERG: By a number of decrees
25 of the government, practically the legal framework for

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1 the activities of our Commission have been set.
2 That's on the government level. We have finished
3 about two and a half weeks ago and offered to the
4 government a draft law for the use of nuclear energy
5 and radiation protection. I would like to say here of
6 great help in this endeavor were the NRC lawyers.
7 This week we're going to continue discussing the draft
8 law in order to put the necessary corrections in. Of
9 course prior even to handing this draft law over to
10 the Parliament, an oppositional segment in the
11 Parliament has been known to have arisen. But I'm an
12 optimist and I believe we'll resolve this problem.

13 COMMISSIONER ROGERS: Thank you very much.

14 CHAIRMAN SELIN: Commissioner Curtiss?

15 Commissioner de Planque?

16 COMMISSIONER de PLANQUE: Yes. Mr.
17 Shteynberg, could you give us your current opinion on
18 any of the short-term serious problems still connected
19 with Chernobyl? I think of the sarcophagus and the
20 uncertainties connected with that. But anything else
21 you might like to comment on.

22 DOCTOR SHTEYNBERG: Well, actually it's an
23 endless topic and one could go on and on on that.
24 First of all, of major concern to everyone is the
25 sarcophagus.

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1 As to technical data, as to the objective
2 data, the instrumentation, the measurement, no
3 substantive changes are observable. There is a
4 problem that we are not able to control and it's not
5 easily measured. It's that of the groundwaters. The
6 overall apprehension is that this site has a great
7 deal of uncertainties.

8 There are many aspects that we do not know
9 of, that we cannot penetrate and the long-term
10 prognosis is that of uncertainty. One thing that is
11 doubtlessly true, that even if the sarcophagus should
12 fail, the actual effect would not be that as had been
13 perceived heretofore. The radiological consequences
14 as we perceive of them at its worst scenario would be
15 having an effect only of several circumference
16 kilometers from the reactor.

17 So that the greatest problem that is of
18 concern to us at present and that has been since 1986
19 is that of contamination and the new radiological
20 wastes and the waste accumulation.

21 COMMISSIONER de PLANQUE: Thank you.

22 CHAIRMAN SELIN: Thank you very much,
23 Doctor Shteynberg. I hope I don't speak English as
24 fast as you speak Russian.

25 Mr. Taylor, one of the many points that

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1 Mr. Shteynberg illustrated is the need for the
2 countries of the East to do their share. I don't mean
3 financially, I mean in an organizational sense. We
4 can do the analyses and we can do these pieces, but
5 the question of retaining residents is pure and simple
6 a question of what pay scale the Ukrainian government
7 will offer and a number of other places. I really
8 strongly feel that our activities have to be
9 reciprocated not only at the technical level where
10 clearly they are, but within the political will of the
11 countries that we're working for and how far we can go
12 is going to be strongly conditioned by the political
13 response of these countries. In particular the
14 seriousness with which they take the safety question
15 themselves.

16 In any event, in this time of tough
17 resources, we have to keep looking to see not only
18 that we're doing what we think is called for, but that
19 the efforts fall on fertile grounds, that there's some
20 response within the capability of the recipient
21 countries to respond and we continually monitor
22 whether there is, in fact, reason to be optimistic.

23 On the bright side, I'm very pleased that
24 we were able to help our Ukrainian colleagues with a
25 basic law. We all feel that's strongly necessary.

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1 Clearly support is needed for the regulators and at
2 the plant level and we just have to keep close track
3 to see what's actually getting through and what's
4 actually happening.

5 The update was excellent. I assume that
6 your recommendation is that at least for now we
7 continue what the level that you've planned in the '94
8 and '95 budget.

9 MR. TAYLOR: Yes, I think so. And Doctor
10 Shteynberg did emphasize how important it is to do an
11 IPE or a PRA on the 1000 because before going in with
12 fixes and some things we may do may not pay off
13 because we haven't seen the safety vulnerability. So,
14 we're going to really push that in the next meeting at
15 the end of the month. But I understand.

16 CHAIRMAN SELIN: Commissioners?

17 Thank you very much for an excellent
18 presentation. I'm sure you'll keep us informed on a
19 periodic basis. Should the Commission at some point
20 believe that a redirection of the program is called
21 for, we'll of course share our thoughts with you. But
22 until then, let's just stay the course, but keep
23 monitoring the results, please. Thank you.

24 (Whereupon, at 3:44 p.m., the above-
25 entitled matter was concluded.)

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DATE OF MEETING: MARCH 8, 1993

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STATUS OF NUCLEAR SAFETY

IN

EASTERN EUROPE

AND

THE FORMER SOVIET UNION

MARCH 8, 1993

OVERVIEW

NUCLEAR SAFETY IN THE FORMER SOVIET UNION

- o NRC'S traditional role in nuclear safety cooperation**
- o Greater concern for safety of Soviet designed reactors after Chernobyl, recent events at Leningrad and Kola and reported safety concerns at South Ukraine**
- o Breakup of USSR hindered Soviet and East European overall maintenance and operational safety activities**
- o Design and technical knowledge and information to support plant activities**

REVISED JCCCNRS STRUCTURE

- o US-Russia JCCCNRS and US-Ukraine JCCCNRS with joint participation and joint annual meetings**
- o NRC and DOE Co-Chairmen, 2 Russian and 2 Ukrainian Co-Chairmen**
- o Technical cooperation and direct assistance (Lisbon)**
- o US Coordinating Committee: DOS, DOE, AID and NRC**
- o Annual JCCCNRS meeting will confirm revised structure**

REMAINING JCCCNRS WORKING GROUPS

- 3. Reactor Vessel Radiation Embrittlement and Annealing**
- 6. Severe Accidents**
- 7. Environmental Transport of Radioactive Material and Health Effects (DOE)**
- 11. Operational Safety (DOE)**
- 12. Nuclear Plant Aging and Life Extension**

LISBON NUCLEAR SAFETY INITIATIVE

- o Establishment of regional training centers in Ukraine (Khmel'nitskiy) and Russia (Balakovo) - DOE**
- o Operational Safety Enhancements - DOE**
- o Risk Reduction - DOE**
- o Nuclear Safety Regulation - NRC**

INITIAL \$ 3.1 MILLION PRIORITIZATION OF PROJECTS

RUSSIA

- o Licensing Basis and Safety Analysis**
- o Inspection Program Activities**
- o Creation of an Incident Response Center**
- o Analytical Support Activities**
- o Establishment of Regulatory Training Program**
- o Fire Protection Support**

INITIAL \$ 3.1 MILLION PRIORITIZATION OF PROJECTS

UKRAINE

- o General Program on the Development of SCNRS of Ukraine**
- o Training Center for NPP and Regulatory Personnel and Development of Corresponding Training Program**
- o Licensing of NPPs and Safety Analysis**
- o Program for Development of a system for Safety Analysis**
- o Joint Inspections (NRC accompaniment) of Ukrainian NPPs for Assessment and Development of Inspection Procedures**

INITIAL \$ 3.1 MILLION PRIORITIZATION OF PROJECTS

UKRAINE

- o Development of Ukrainian NPP Inspection Activities Based on the Results of Joint Inspections (NRC accompaniment)**
- o Program on Enforcement Regulations**
- o Program on Waste, Spent Fuel and Nuclear Materials Management Program**
- o Program on Creation of a Legal Framework**

ADDITIONAL PROJECT SUPPORT

RUSSIA

- o Creation and Development of Material Control and Accounting (MCA) System (supported under Safe Secure and Dismantlement (SSD) Program)**
- o Establishment of Regulatory Training Program and Fire Protection Support are partially funded**

ADDITIONAL PROJECT SUPPORT

UKRAINE

- o Program on the Physical Protection Regulation and Program on the Safeguards and Non-Proliferation Regulation (supported under Safe Secure and Dismantlement (SSD) Program)**
- o Program on Enforcement Regulations is partially funded**

ADDITIONAL PROJECT SUPPORT

UKRAINE

The following projects require funding:

- **Program on the Fire Protection Regulation**
- **Program on the Creation of Emergency Response Facility**
- **Program on the Creation of Incident Report System**
- **Program on the Development of Research Support for Regulatory Activities**
- **Program for Regulating Radioactive Sources Utilized in Industry and Medicine**
- **Program on the Creation of a Competent Organ (authority) of the Ukraine and of Regulations Governing the Transportation of Radioactive Materials**

POTENTIAL ADDITIONAL DIRECT ASSISTANCE

- o Procurement of VVER-1000 analytical simulators for Ukrainian and Russian regulators**
- o Assist in drafting regulatory legislation for Ukraine and Russia**
- o Independent assessment of the RBMK reactivity void coefficient**
- o Assist in adapting NRC developed computer codes to perform assessment of existing Russian confinement/containment designs in evaluating severe accidents and coping methods.**

POTENTIAL ADDITIONAL DIRECT ASSISTANCE

- o Perform Individual Plant Examination at a VVER-1000**
- o Assist Russian peer review of Swedish PRA on Ignalina**
- o Support analytical activities to implement US accident analysis codes**

IMPLEMENTATION ACTIVITIES

- o July 92 meeting with Chairman of GAN and SCNRS established project priorities**
- o September 92 Inter-Agency Agreement signed with USAID**
- o December 92 meeting with GAN developed implementing plans**
- o March 93 meeting with Chairmam of SCNRS will further develop Ukrainian plans**
- o Approximately 30 groups comprising about 130 Russians and Ukrainians will participate in the US during 1993**
- o Equipment deliverables and programs are proceeding as agreed**

HEALTH AND ENVIRONMENTAL EFFECTS

- o JCCCNRS WG-7 involves the cooperative effort on health and environmental effects from the Chernobyl Accident**
- o New MOC, if implemented, would be under the auspices of Peaceful Uses of Atomic Energy (PUAE)**
 - Comparable to JCCCNRS MOC**
 - Will eventually absorb activities of Working Group 7.0 for the Russian Federation**
- o DOE/NRC Chelyabinsk data preservation proposal**

JCCCNRS

- o Considerable understanding and cooperation have developed and resulted in excellent working relationships. Recognition of each side's expertise have benefitted Ukraine, Russia and the US. This has resulted in the expansion of the cooperative efforts in certain areas and has led to implementation of the Lisbon Initiatives under the JCCCNRS.**
- o Some of our cooperative efforts have developed into joint arrangements. Notable has been the severe accident research in the areas of corium interaction with the vessel, hydrogen combustion and detonation and validation of CORCON-MOD 3 computer code. Recently, the Russians delivered a presentation to NEA on their in-vessel melt retention experiments.**
- o We have received positive feedback from our Russian and Ukrainian counterparts with regard to the progress and direction of our Lisbon efforts.**

RECOMMENDATIONS FOR FUTURE U.S. COOPERATION

o FIRE SAFETY

- Present approach has been to provide fire safety improvements outside of engineered fire safety analysis**
- Responsibility for plant level nuclear fire safety**

o OPERATIONS

- Minor improvements may be significant, for example hand-held, communication radios**

o DESIGN SPECIFIC AND PLANT SPECIFIC MODIFICATIONS

- Perform IPE on VVER-1000 to establish a "model plant"**
- Implement short-term fixes on RBMK's and VVER-440/230's**
- Russian and Ukrainian involvement in design, analysis and plant modification is important**

INTERNATIONAL DEVELOPMENTS AND CONCLUSIONS

- **THE GROUP OF SEVEN (G-7) SUMMIT COUNTRIES' INITIATIVE**
- **G-24 COORDINATING MECHANISM**
- **IAEA**
- **NEA**
- **EASTERN EUROPE**
- **RESULTS OF NRC CONSULTANTS BRIEFING**
- **CONCLUSIONS**

THE GROUP OF SEVEN (G-7) SUMMIT COUNTRIES

- **In July 1992 G-7 placed improvement of nuclear safety in the FSU and EE on its agenda for the first time. Action Plan recommended:**
 - **Operational Safety Improvements**
 - **Near Term Technical Improvements**
 - **Improvement of Nuclear Safety Regulation**
 - **Examination of Energy Alternatives to Reduce the need for less safe plants**
 - **Upgrade better plants**
- **Proposed Multilateral Fund**
 - **now established in EBRD.**
 - **European donors have committed resources in the tens of millions of dollars for design/hardware improvements.**
- **Next G-7 Summit in Tokyo in July**

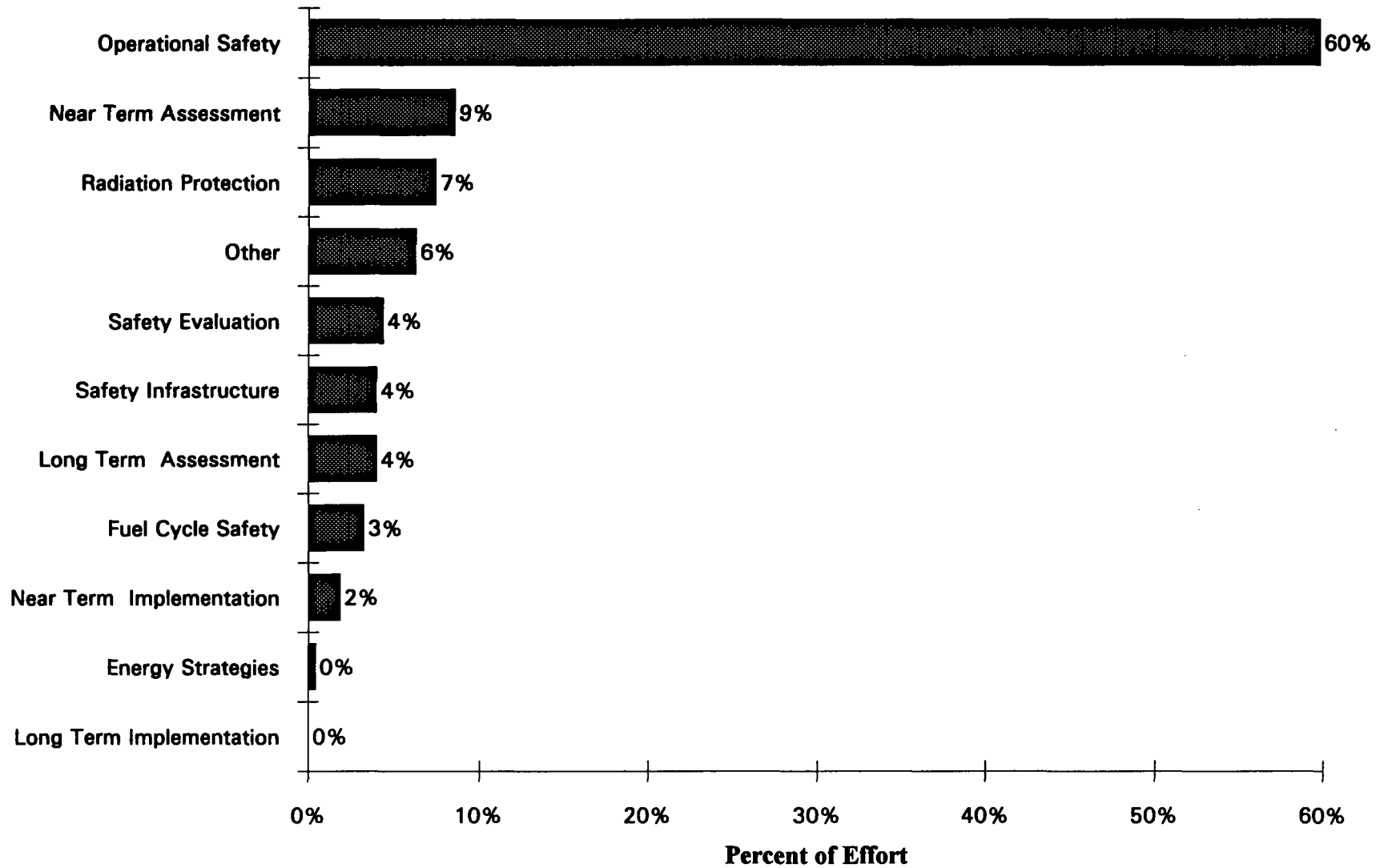
G-24 COORDINATING MECHANISM

- **Following Munich Summit, G-24 coordinating mechanism established to:**
 - 1) monitor projects,**
 - 2) solicit recipient needs, and**
 - 3) assure consistency / avoid duplication.**
- **Organization includes:**
 - plenary working group,**
 - steering committee, and**
 - secretariat headed by administrator, with staff provided by EC**
 - country experts**
- **NRC expert will work on temporary duty at the G-24 until at least the beginning of May.**
- **G-24 database maintains information on assistance programs and is available to all participants.**

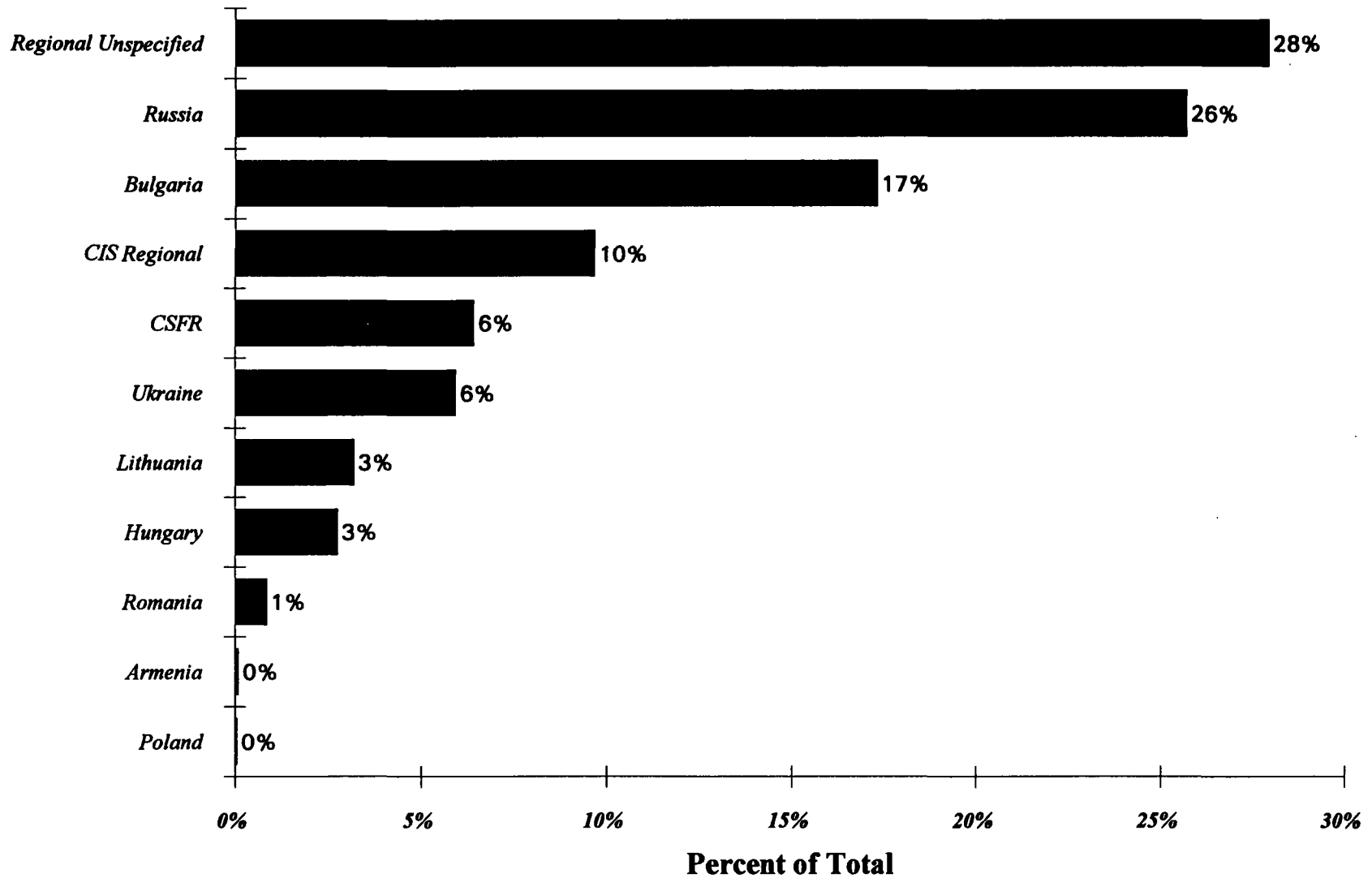
G-24 DATA BASE PRELIMINARY PROJECT ASSESSMENT

- **Total contribution about \$350 to \$400 million for safety.**
- **Principal donors include the EC, USA, Japan, Germany, Italy, Canada, France, and Sweden**
- **Principal recipients are Russia, Bulgaria, the CSFR, and Ukraine, with large amounts designated Regional, either for the CIS or unspecified.**
- **Principal area of interest is Operational Safety**

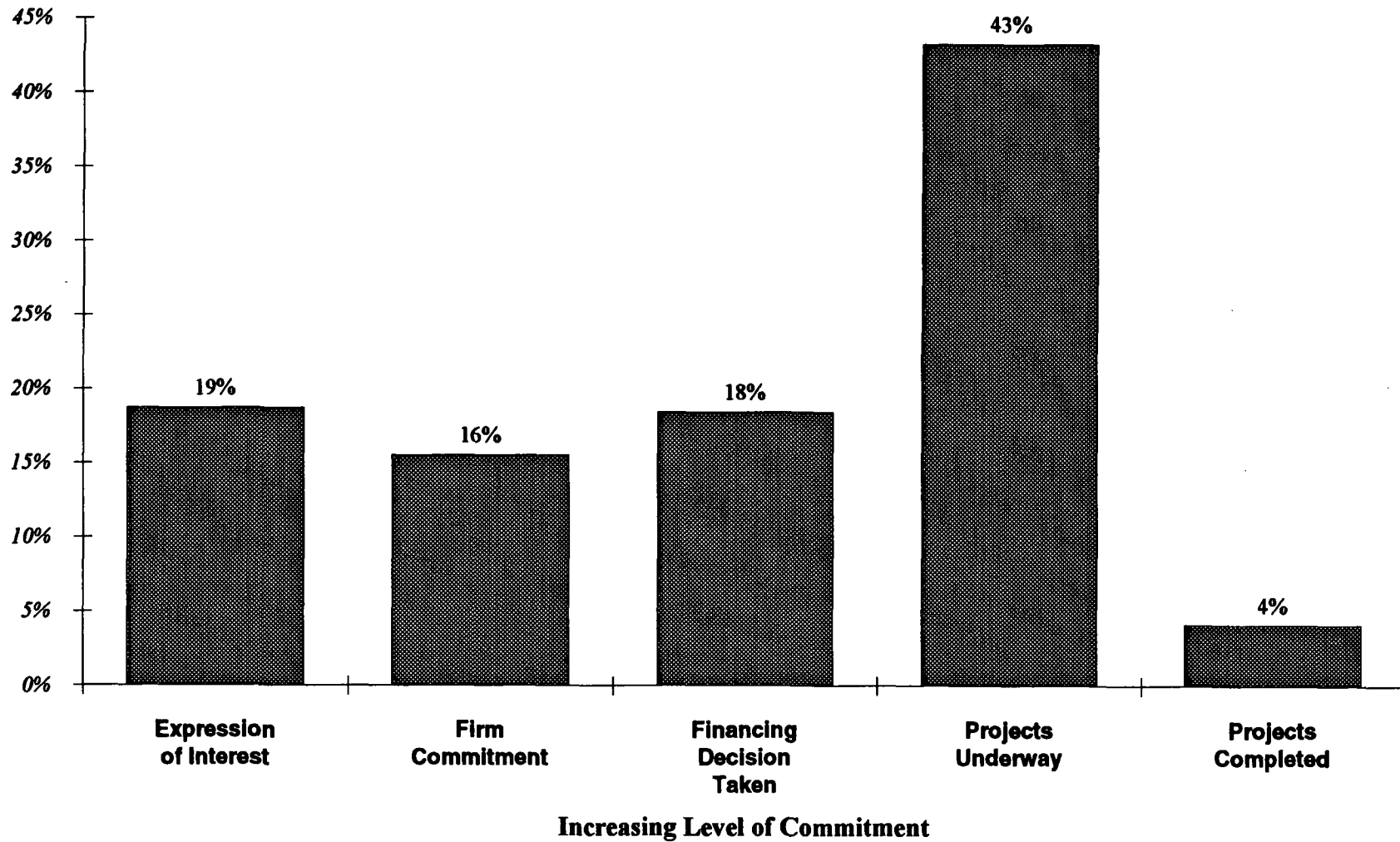
LEVEL OF EFFORT BY TECHNOLOGY SECTORS



LEVEL OF COMMITMENTS TO RECIPIENTS



STATUS OF PROJECT COMMITMENTS IN G-24 DATA (Value of Projects)



INTERNATIONAL ATOMIC ENERGY AGENCY

- **International Nuclear Safety Convention**
 - **Disagreements remain over scope and level of detail**
 - **Next meeting on INSC in G-7 context**
- **Central and Eastern European Safety Program**
 - **VVER 440/230 safety analysis work completed**
 - **VVER 440/213 and 1000/320 work beginning with analyses**
 - **RBMK work also beginning**
 - **"Extra-budgetary contributions" of \$1.5 million requested for both VVER and RBMK work.**
- **INSAG completed revised assessment of Chernobyl accident, emphasizing hardware issues.**
- **IAEA and the EC Secretariat will exchange staff members to improve coordination.**

NUCLEAR ENERGY AGENCY

- **Senior Regulators requested views on assistance being provided from a regulatory perspective. Meeting resulted in:**
 - **Link established with VVER reactor regulators, and**
 - **Recommendation to Steering Committee not to seek a coordinating role.**
- **NEA has undertaken fact-finding missions related to:**
 - **enhancing nuclear safety research capabilities in Russia and Ukraine, and**
 - **possible solutions for long-term isolation of the radioactivity at Chernobyl.**
- **Project underway to identify and assist R&D facilities in FSU and assist in modernization of hardware and software capabilities.**

EASTERN EUROPE

- **NRC assistance sponsored by A.I.D. is about \$1.6 million for FY91-92, with CSFR, Hungary, Bulgaria and Lithuania, emphasizing:**
 - **Computer code users group memberships,**
 - **Assignments to NRC,**
 - **Participation in technical workshops, and**
 - **Training assignments at the TTC.**
- **DOE assistance to Eastern Europe is \$2.4 million in bilateral and IAEA-related safety activities.**

AREAS OF AGREEMENT AT NRC-SPONSORED CONSULTANTS MEETING

- **G-7 should look at longer term improvements to RBMKs and VVER 440/230s.**
- **Seek agreement on a Lead Plant concept to focus U.S. assistance and gain support of plant managers.**
- **Continue present programs with regulators.**
- **Emphasize site-specific measures.**
- **Help recipients help themselves and each other.**
- **Improve communication between Russian plant designers and operators in other countries and between skilled users, e.g., Hungary and Finland, and other EE countries.**
- **Improve maintenance assistance to prevent further deterioration of the plants and add Maintenance as a JCCCNRS working group.**

CONCLUSIONS

- **All major nuclear countries are giving considerable attention to nuclear safety problems in the FSU and Eastern Europe.**
- **Several new actors are now involved in providing or coordinating assistance (G-7, G-24, EBRD, more individual countries) .**
 - **There have been multiple entry points for this involvement (e.g., Sweden/Ignalina, France/Kozloduy, Finland/Sosnovy Bor), with little substantive, advance coordination.**
 - **Much useful work has been done, primarily in studies and assessments.**
- **It is necessary to move from analysis to practical improvements**
 - **Assistance must be targeted to specific countries and sites.**
 - **Reactor designs are all of Soviet origin, but their operations differ by country and site.**

CONCLUSIONS (Cont'd.)

- **However, we believe improvements will be slower than we had hoped:**
 - **Officials complain that assistance does not seem to be getting through to the plant and operator level; funding is spent in donor countries.**
 - **Economic conditions and decisions in many of the recipient countries do not favor improved nuclear safety.**
 - **Because of their need for power FSU states have shown an interest in resuming construction on several nuclear power plants.**
 - **Regulatory authorities need to be strengthened in the FSU.**
 - **Ukraine is slowly developing a government infrastructure for dealing with nuclear safety and is facing energy needs that may require keeping the Chernobyl plant open.**

CONCLUSIONS (Cont'd.)

- **Nonetheless, we are responding to what the regulators in these countries have asked for, and we need to stay the course.**
- **Have established project agreements with the Czechs and Slovaks, Hungary, Bulgaria, Lithuania, Russia and Ukraine to help them improve regulation.**
- **Need to move assistance to the plant level.**
- **Will require a long term effort and continued funding, both bilateral and multilateral, public and private.**
- **Maintain current levels of funding for short term programs. Seek creative new ways to increase financing, or the conditions for financing, of long-term energy options.**
- **Support multilateral funding efforts through international development institutions such as the World Bank and the EBRD.**